

WHAT IS CLAIMED IS:

1. A fuel cell, comprising:
 - a fuel electrode which has a fuel-diffusion layer for diffusing fuel;
 - an oxygen electrode which has an oxygen-diffusion layer for diffusing oxygen; and
 - an electrolyte layer which is arranged between the fuel electrode and the oxygen electrode,wherein the fuel-diffusion layer has higher water-repellency than that of the oxygen-diffusion layer.
2. A fuel cell, comprising:
 - a fuel electrode which has a fuel-diffusion layer for diffusing fuel and a fuel-reactive layer for having the fuel react, the fuel-reactive layer being in contact with the fuel-diffusion layer;
 - an oxygen electrode which has an oxygen-diffusion layer for diffusing oxygen and an oxygen-reactive layer for having the oxygen react, the oxygen-reactive layer being in contact with the oxygen-diffusion layer; and
 - an electrolyte layer which is arranged between the fuel electrode and the oxygen electrode,wherein the fuel-diffusion layer has higher water-repellency than that of the oxygen-diffusion layer.
3. The fuel cell as claimed in Claim 1, wherein each of the fuel-diffusion layer and the oxygen-diffusion layer has at least one water-repellent-material-containing layer which contains a material having water repellency, and the water-repellent-material-containing layer of the fuel-diffusion layer has higher water-repellency than that of the oxygen-diffusion layer.
4. The fuel cell as claimed in Claim 3, wherein the content

of the material having water repellency in the water-repellent-material-containing layer of the fuel-diffusion layer is larger than that of the material having water repellency in the water-repellent-material-containing layer of the oxygen-diffusion layer.

5. The fuel cell as claimed in Claim 4, wherein the content of the material having water repellency in the water-repellent-material-containing layer of the fuel-diffusion layer is larger than that of the material having water repellency in the water-repellent-material-containing layer of the oxygen-diffusion layer by at least 5wt%.

6. The fuel cell as claimed in Claim 3, wherein the content of the material having water repellency in the water-repellent-material-containing layer of the fuel-diffusion layer is 20 to 80wt%.

7. The fuel cell as claimed in Claim 3, wherein the content of the material having water repellency in the water-repellent-material-containing layer of the oxygen-diffusion layer is 15 to 65wt%.

8. The fuel cell as claimed in Claim 3, wherein the water-repellent-material-containing layer of the fuel-diffusion layer and the water-repellent-material-containing layer of the oxygen-diffusion layer include a conductive material, respectively, in which the conductive material in the water-repellent-material-containing layer of the fuel-diffusion layer has higher water-repellency than that of the conductive material in the water-repellent-material-containing layer of the oxygen-diffusion layer.

9. The fuel cell as claimed in Claim 3, wherein the water-repellent-material-containing layer is a layer in which the water repellency material is carried by a particulate conductive material.

10. The fuel cell as claimed in Claim 3, wherein the fuel-diffusion layer has the water-repellent-material-containing layers at its both sides.

11. The fuel cell as claimed in Claim 3, wherein the oxygen-diffusion layer has the water-repellent-material-containing layers at its both sides.

12. The fuel cell as claimed in Claim 1, wherein the water contact angle on the surface of the fuel-diffusion layer is larger than the water contact angle on the surface of the oxygen-diffusion layer by at least 5°.

13. The fuel cell as claimed in Claim 1, wherein the water contact angle on the surface of the fuel-diffusion layer is 100 to 160°.

14. The fuel cell as claimed in Claim 1, wherein the water contact angle on the surface of the oxygen-diffusion layer is 90 to 150°.

15. The fuel cell as claimed in Claim 1, wherein the fuel cell uses hydrogen as fuel.

16. A fuel cell device, comprising a fuel cell as claimed in any one of Claims 1 - 15.

17. A fuel cell device, comprising:
a fuel cell main body which includes
(a) a fuel electrode which has a fuel-diffusion layer

for diffusing fuel;

(b) an oxygen electrode which has an oxygen-diffusion layer for diffusing oxygen, the fuel-diffusion layer having higher water-repellency than that of the oxygen-diffusion layer; and

(c) an electrolyte layer which is arranged between the fuel electrode and the oxygen electrode;

fuel supply means for supplying fuel to the fuel electrode;

and

oxygen supply means for supplying gas containing oxygen gas to the oxygen electrode.

18. The fuel cell device as claimed in Claim 17, further comprising water supply means for supplying water to the oxygen electrode.